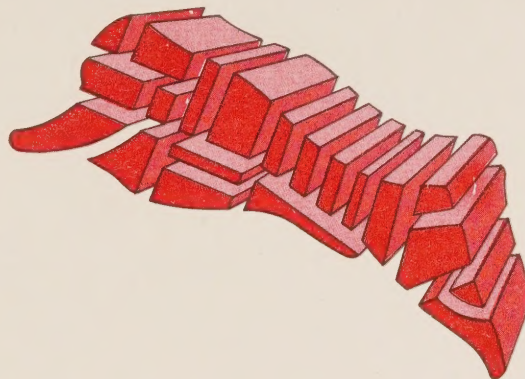


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COMMISSION OF INQUIRY INTO THE MARKETING OF BEEF AND VEAL

DEVELOPMENTS IN CENTRAL PROCESSING OF BEEF IN CANADA

Research Report No. 6
by
H. Bruce Huff
Barry D. Mehr



Ottawa
February 1976

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N O T E

The following research report was prepared at the request of the Commission of Inquiry into the Marketing of Beef and Veal to assist it in fulfilling its mandate. The analysis and conclusions contained in this report are the responsibility of the author(s) and do not necessarily reflect the views of the Commission.

Foreword

Information for this study was obtained from an extensive questionnaire to packinghouses, wholesalers and retailers. More complete results of this questionnaire are in Research Report No. 1. In addition, personal interviews were held with a number of firms, trade sources and government staff in Canada and the U.S. Submissions from firms and statements at the Public Hearings of the Commission also provided additional information. To those co-operating, the authors are most appreciative.

The study was assisted in data collection and tabulation by several members of the Commission staff including David Clarke, Mark Spearin and Arlene Pede. The authors wish to express thanks to Ruth Goddard in the preparation of this report for publication.

February 1976
Ottawa

H. Bruce Huff
Research Director

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1. INTRODUCTION

The beef marketing system in Canada is in the midst of its third major change in this century. In the early 1900's, the introduction of refrigeration greatly extended the preservation time for meat, enabling more stable sales of fresh beef and the location of packing plants closer to the source of live cattle.¹ The next significant change occurred with the development of retail chain supermarkets with self-serve, pre-packaged meats. Supermarkets grew rapidly creating an immense concentration of buying power. The third major change, now in progress, is the adoption of a form of processing called "boxed beef". This new development has already had an impact on the beef marketing system in terms of improved efficiency, quality, equity and stability, and these effects will become more substantial as the extent of central processing increases.

The Commission's concern about central processing related to three basic questions on which there was little available, reliable information. These were:

- (i) What is the present status (i.e. form, extent and technology) of central processing and its likely future direction?
- (ii) Who controls the processing facilities and what implications does this have for concentration in bargaining power, ability to service all types of markets, regional comparative advantage and distribution efficiency?
- (iii) What is the magnitude of real and potential savings from centralized processing of beef and what other advantages exist from its adoption?

By using the information obtained in response to these questions, the Commission would be able to identify any impediments preventing its adoption and what types of policies and programs would be most appropriately introduced by governments. Furthermore, the Commission is concerned as to the necessary modifications in the type and extent of services traditionally supplied by government to ensure the most effective marketing system under the emerging structure of beef markets.

This paper contains much of the information collected and evaluated in response to these concerns. Chapter 2 describes central processing; Chapter 3 traces its current level and nature; Chapter 4 provides an evaluation of its impact; Chapter 5 outlines the technological constraints on further central processing, and, finally, Chapter 6 reviews the implications of central processing.

¹ Other factors besides refrigeration were also responsible for this change.

2. WHAT IS CENTRAL PROCESSING?

The term "processing" in the beef industry commonly refers to the operation of reducing dressed carcasses, sides, quarters to primal and sub-primal cuts. This restrictive use of the term "processing" indicates the extremely limited form of product development that has taken place in the industry.²

Beef sold by retail grocers in Canada historically was received at individual stores in carcass form from a packer, either direct from the slaughtering plant or through a wholesale warehouse owned by packers, independent wholesalers or retailer-owned wholesale distribution system. The carcass was then broken in the backroom of the retail store into consumer-ready cuts, wrapped, priced and displayed. When retailers were able to sell more of a specific retail cut, they might purchase additional primal cuts. Also, boneless beef was purchased by retailers to satisfy their ground meat requirements.

Central processing to "boxed beef" is a significant departure from this historic method of processing beef for the consumer. It involves cutting the carcass or its components (sides, quarters or primal cuts) into trimmed sub-primal cuts.³ These cuts are either vacuum wrapped in oxygen impermeable film,⁴ then boxed, or simply boxed with the introduction of dry ice (CO₂) snow or pellets. When the retail store receives boxed beef it must be further processed from this sub-primal state into packaged retail cuts. Thus, the main features of this type of central processing are that the carcasses are broken into sub-primal cuts at a central location, enabling improvements in processing efficiency obtained through conversion from a single unit to an assembly line, high volume processing procedure. Also, shelf life and bacterial growth control can be greatly increased. Furthermore, bones and fat are left at the central location reducing the volume of product shipped to retail stores and enabling potentially greater utilization of by-products by retaining a higher percentage of edible tallow and trimmings.

² The amount of beef, with the exception of brisket points, otherwise changed from a fresh state, is extremely small as most beef in Canada is still consumed as a fresh product (although some of it, particularly ground beef, may have been previously frozen).

³ The Appendix describes some of the common sub-primal cuts prepared by central processing as well as average carcass yields into these cuts.

⁴ The major distributor is the Cryovac Division of W.R. Grace and Co. and this process is frequently termed "cryovacing".

3. EXTENT OF CENTRAL PROCESSING IN CANADA

Centrally processed "boxed beef" is a relatively recent innovation in the Canadian beef industry, coming largely in the last five to 10 years. There are three main types of firms involved in central processing. First, the four major packers are doing central processing in at least one of their plants. Some independent packers have specialized in central processing and are tied largely to one retailer. Secondly, there is some boxing being done in packer branch houses and in independent wholesaler units, but in very limited quantities. Thirdly, the majority of central processing in Canada is being done in facilities owned by retailers. Four retailers dominate in central processing of beef: Safeway, Kelly Douglas, Steinbergs and Oshawa Group.

From the Commission's survey of firms,⁵ it was estimated that in 1974, 210,000 cwt. or 17 percent of total beef boxed was processed by packers, 5,000 cwt. or 0.4 percent by independent wholesalers and packer branch houses and 1,037,000 cwt. or 83 percent by retailer-owned plants (Table 1).

Packers shipped most of their boxed beef from Alberta (47 percent) and Ontario (26 percent) in 1974. No processing was done in either the Maritimes or Quebec. The majority of the total boxing by packers, 74 percent, is accounted for by the major packers. Most of this is done at their old, full-line plants. Of the total shipments by packers only 1.4 percent was in the form of boxed beef in 1974 (Table 2) and 2.8 percent in the first quarter of 1975 (Table 3).⁶

Independent wholesalers and packer-branch houses account for a very small amount of the total boxed beef and most of this probably is for the hotel, restaurant and institutional (HRI) trade, rather than retail grocery stores.

Retailers owning their own boxing facilities usually locate these in the region where the product is consumed. A main exception is Safeway which serves B.C. and Ontario as well as its large local Alberta market from its Lucerne Foods plant, a wholly-owned subsidiary, in Calgary. The majority of carcass beef destined for boxing at the retail plants owned in B.C. and Quebec is shipped from Alberta.

⁵ The Commission's survey of meat packing plants covered 89 percent of inspected slaughter. Its survey included all major wholesalers, and retailers in 10 metropolitan centres covering all large firms in an area accounting for 70-75 percent of the population in Canada.

⁶ Some packers did not provide information on the specific form of shipments and, therefore, there may be an underestimation of this total.

There are distinctively different regional patterns in the percentage of total beef received in boxed form at the retail level (Table 4 and 5). The majority of large retailers in B.C. are on a boxed beef program and three quarters of receipts at retail stores were in that form. A similar situation exists in Alberta. In Saskatchewan, Manitoba and the Maritimes, there are no retailers on a boxed beef program. In Ontario and Quebec, the situation is mixed. Although some of the six major corporate chains in Toronto are on a total boxed beef program only 8 percent of the beef was received in boxed form in 1974 (Table 4) and 11 percent in the first quarter of 1975 (Table 5). In Montreal, two of the three major corporate chains are on total boxed beef, and nearly 40 percent of the beef is received in this form.

For retailers, there are considerably more corporate than voluntary chains on boxed beef programs (Table 6). This is very similar to the U.S. situation.⁷ Size, however, does not appear to be an important deterrent as many small and medium regional divisions of retail firms are on a boxed beef program (Table 7).

To help predict the growth in and location of boxed beef production, meat packers supplied estimates of their present boxing capacity at each of their plants and their expectations as to the percentage of their beef sales that will be "boxed beef" by 1978. Since some of the largest packing plants were unable to provide forecasts of growth trends, generalizations from this data are used. Nevertheless, many major packers plants estimated that 50-90 percent of their sales would be in the form of boxed beef by 1978, despite an apparent surplus boxing capacity at the present time. On the other hand, the independent packers did not visualize much, if any, central processing except for those firms now boxing beef.

Retailers currently have a capacity, probably exceeding that of the packers, to centrally process beef. Many of the major retail chains foresee at least an increase, if not a complete adjustment to receiving their beef in boxed form. Nevertheless, several dominant firms not now on a boxed beef program did not expect to be on one in the near future.

A survey of food retailers was recently completed in the U.S. and Canada as to the form in which they received beef. The results are summarized in Table 8. The survey shows that between 1972 and 1974, the U.S. moved slightly ahead of Canada and is now receiving a higher percentage of its

⁷ In the U.S., for 1974, the independents received 62 percent of their beef in carcass form compared to 24 percent for chains. Packaging Digest, (July 1975).

beef in the form of primal and sub-primal cuts, e.g. 68 percent vs. 63 percent. However, in Canada, the majority of the primal cuts reach stores in a vacuum bag (63 percent) while in the U.S., it is slightly more than one half.⁸ It appears from these studies that the extent of central processing in the two countries is increasing at almost parallel rates and is at almost the same level of progress, despite the fact that Canadian development started approximately two years after the U.S.

⁸ This survey indicated slightly more beef arrived at the retail level in vacuum plastic film than the Commission survey (40 percent vs. 30 percent). However, Commission estimates are based on actual data from firms and aggregate industry estimates could be more reliable.

4. EVALUATION OF THE IMPACT OF CENTRAL PROCESSING

The adoption of central processing of beef carcasses to the sub-primal level (i.e. boxed beef) will have a very marked effect on the beef industry and its marketing system. It will increase efficiency of the packer-to-retailer distribution system, improve net returns from the sale of carcasses, provide a more sanitary and wholesome product, potentially could remove traditional buying prejudices as a factor in beef marketing and allow all grades and sexes to find their rightful market levels based on quality and retail yield. On the other hand, it may modify the structure of the carcass market, probably by increasing the level of concentration of ownership at both the packer and retail level, which might reduce the availability of public price information and distort regional comparative advantages. Further, the distribution system is likely to be substantially modified as adjustments are made to sell primal cuts instead of carcasses. This chapter examines each of these aspects of central processing, describes their impact and insofar as possible, quantifies the change.

Distribution Efficiency

The most fundamental argument espoused by the industry for the adoption of boxed beef is its increased efficiency, with the consequent reduction in marketing costs for beef.⁹ This increased efficiency arises from savings in transportation, product shrink, labour costs, investment for equipment, improved inventory control, etc.

The transportation costs for boxed beef are lower than for carcasses. Heavier loads are possible since more pounds of boxed beef can be loaded into railway cars than if it was in carcass form, thereby permitting a lower rate per pound. As much as 16 percent of the carcass in the form of bones and fat can be removed at the boxing plant and therefore never shipped to retail stores.¹⁰ Even if the bones and fat are shipped to the same market area (i.e. rendered tallow from Alberta to Eastern Canada) it can be done at a lower freight rate than for fresh beef.

⁹ The Commission received considerable information at its public hearings relating to the central processing of beef. See testimony by Mr. Al Graham, Oshawa Group, p. 3706; Mr. F.G. Bradley, F.G. Bradley Co., p. 3594-5; Mr. A.W. Breach, A&P, p. 3791; Mr. W. McLean, Canada Packers, p. 13-14; Mr. A.H. Beswick, Swifts, p. 119 of Public Hearings Transcripts.

¹⁰ An example cutting test is shown in the Appendix.

The investment in equipment required to break carcasses at each retail store is considerably higher than at a central location since its utilization rate at a central processing location is considerably higher. Consequently, retail stores receiving boxed beef can reduce expenditures on equipment and processing space requirements. The equipment and space savings may not be realized immediately at established locations but may arise only as stores are built or remodelled and equipment is depreciated or sold. The utilization of space in the retail stores for merchandising instead of processing could result in improved earnings for the firm since this space is usually on land which is much more expensive than that for the central processing plant. Equipment costs for meat processing at the retail level for moderate size stores are estimated to be about \$90,000-\$110,000 per unit.¹¹ Estimated savings in equipment for retail stores using only boxed beef is \$8,000-\$10,000 per unit.¹²

Potential additional savings are from reduced labour costs. The central processing plant utilizes labour much more efficiently because it suits efficient assembly line techniques and reduces the need for skilled butchers. Also, skilled butchers are becoming increasingly scarce.

Retail stores may be able to simplify their accounting and inventory control with boxed beef as inventory levels may be assessed more accurately because dating and product specifications are clearly marked.

To illustrate some of the efficiencies noted above, it is useful to examine two U.S. studies which analyzed processing and distribution costs which are related to two of the common distribution situations existing in Canada. The first is the self-sufficient Ontario market where beef is transported a short distance from packing plants to retailers and the second is the Alberta to Quebec market where beef is moved a long distance from a surplus production area to a deficit market. While these are U.S. studies, it is felt that the results are transferable to the Canadian situation yielding similar relative values.

¹¹ A.W. Breach, A&P, speech at Annual meeting of Meat Packers Council, February, 1975.

¹² F. Marshall, Oshawa Group, p. 3713, vol. 35, Public Hearings.

A study in 1967 by a research team from Cornell University examined costs for four alternative distribution systems for beef for a medium-sized retail chain (sales volume 40 million lb. of beef.)¹³ The alternatives are indicated below with examples of Canadian firms operating in a similar manner. These are:

- (i) receiving carcass beef direct from packers to individual stores (e.g. Dominion);
- (ii) receiving carcass beef at a chain's central warehouse which distributes carcasses to individual stores (e.g. Boeuf-Merite, Montreal and Miracle Food Mart, Toronto);
- (iii) receiving carcass beef at a chain's central warehouse, breaking it into primal and sub-primal cuts and distributing these to individual stores (e.g. Steinbergs, Montreal and Safeway, Calgary);
- (iv) receiving beef in primal cuts from packers at a chain's central warehouse and distributing these directly to stores (no example in Canada).

Costs for meat handling and clerical labour in the store and in the distribution centre were estimated for each of these alternatives at the present level and with an increase of 15 and 30 percent in volume (Table 9). While the lowest cost was the fourth alternative (chain operated central warehouse receiving primals), the gross margin, i.e. the selling price less the purchase price of beef, was less than the third alternative (chain's central processing) because of the considerably higher price for beef in primal form. Also, the firm was able to undertake other types of processing such as beef patties, corned beef, etc. The cost savings under the last two alternatives are probably understated since no account was made of savings in equipment at store level. Without considering these, the difference in costs are rather small, less than one cent per pound between the highest and lowest cost alternative.

Another study examined the costs involved with 11 alternative arrangements for processing beef.¹⁴ Eight of these were for fresh beef, three were for frozen beef. These included most situations which exist in Canada as well as others which are presently not used.

¹³ Emery Weatherly, Wendell Earle and Earl Brown, Alternative Methods of Meat Distribution, A.E. Bull. 232, Cornell University (1967).

¹⁴ R. Lichty, An Analysis of Alternative Fresh and Frozen Meat Distribution System, Kansas State University (1971).

The lowest cost systems were packer shipments of boxed beef to chain distribution centre and shipments of carcasses to chain central processing centre (Table 10). Slightly higher costs (one cent per pound) were found for the two options of shipping carcasses and boxed beef direct from packers to retailers. Highest costs were for frozen beef option which were 8 cents to 18 cents per pound higher than the lowest cost option.

Both of these studies highlight that efficiencies achieved by central processing are not exceptionally large. Other factors that are not measured in these two studies may be more important, however.

Increased Returns

Another persuasive argument favouring central processing is the increased return from the beef carcass. This arises from a number of reasons relating to fewer losses and more profitable sales. First, by removing by-products at a central processing plant, potentially greater utilization is possible, since some of the trimmings and edible fat produced at the retail level is lost from human consumption. The latter would still have to be rendered at an inspected plant to be utilized as edible tallow.¹⁵ Secondly, there is less shrink when the beef is in a vacuum package. Under normal conditions, there is about 0.5 percent shrink for vacuum packed boxed beef, while naked beef will shrink 3 to 5 percent.¹⁶ Thirdly, there is less trim required at retail for boxed beef than for naked beef as a result of damage to or contamination of parts of the carcass during transit. Also there is less exposed surface in storage requiring trimming to make meat presentable for sale.

At the retail level, selling is considerably improved. The meat department staff can concentrate on their specialty, mass merchandising, by ensuring that the widest variety of cuts are always available to consumers rather than being held to sales in biological proportions. When carcasses are used because of the store's processing requirements, often more staff time and attention is allocated to processing than merchandising. Moreover, sales volume varies sharply making labour utilization schedules difficult. Most important with the extended shelf life, there are fewer mark-downs to move a slightly stale (i.e., off-colour or off-taste) product.

¹⁵ Not all central processing facilities are federally health inspected.

¹⁶ Estimates from meat packers in central processing.

A fundamental consideration for adoption of central processing is that it would allow beef cuts to be sold in those markets where demand is greatest, thereby maximizing the total return to the carcass. Certain regions, and certain retail outlets have consumers with quite distinctive demand preferences. By the most appropriate distribution of beef cuts the highest price is obtained in each market. This involves a more sophisticated balancing of cuts than most traditional packinghouse firms would prefer to do. This is also a most persuasive reason for retailers not to operate their own facilities since they do not have the opportunity to merchandise to all possible markets. In fact, the markets to which they are oriented mainly have similar demands negating all of the above proposed opportunities. Packers, on the other hand, are likely to serve a larger geographic area, different types of retailers and processors and have more experience in balancing the sale of primal cuts.

A drop in demand in a one or two-week period greatly affects live cattle prices under a market situation where beef must be sold shortly after slaughter. The increased shelf life of boxed beef allows some short-run storage to minimize these price fluctuations. Thus, a major snowstorm in Montreal under the existing market conditions would lower cattle prices the following week all across Canada. Boxed beef could greatly reduce that price variation.

Improved Sanitation

Consumers are pressing for more stringent health regulations and more stringent controls at the retail level will likely be instituted.¹⁷ Naked beef is easily contaminated by bacteria. Exposure to other beef, clothing, etc., increases the amount of surface bacteria for beef carcasses. Consequently, every time beef is handled, when temperatures are significantly above 0°C, or when it is moved to a new environment, the bacteria count increases. A U.S. study found that carcass beef is sometimes handled 19 times from packer to retailer.¹⁸ Sometimes it is delivered to stores in unrefrigerated trucks with carcasses piled on the truck floor. Drivers may have to walk on these carcasses or drag them on the floor, while wearing clothing that is unlikely to be completely sanitary. These types of

¹⁷ Department of Health and Welfare are currently discussing acceptable bacteria levels at retail stores with the trade.

¹⁸ A.T. Kearney and Co., Ltd., Feasibility of a Physical Distribution System Model for Evaluating Improvements in the Cattle and Fresh Beef Industry, United States Department of Agriculture (1969)

contamination could not occur with boxed beef. The adoption of universal health requirements for the maximum permissible bacteria counts at retail stores potentially could force retailers to exclusive use of only boxed beef and perhaps may even force the industry to central processing at packing plants rather than at another location such as retailer's central warehouse.¹⁹

Reduced Discrimination

Many retailers insist on visual inspection of carcasses. This, coupled with the grading system and specific weight ranges, is used to select carcasses for their stores. There has been reluctance by some retailers to use certain types of carcasses - heifers or carcasses with poor conformation (often called dairy type or A1-X). Evidence from Canadian meat scientists indicate that steers and heifers of equal weight and grade yield approximately equal quantities of retail cuts.²⁰ On occasion, heifers are priced 7-10 cents/lb. less than steers on a live-weight and 3-6 cents/lb. on a carcass basis. This cannot be justified on a quality or yield basis. Also, research studies have shown that dairy-type (A1-X) carcasses yield a higher retail cutout than A2 but nevertheless they are priced considerably below them (often 5 cents/lb. or more).²¹ The introduction of boxed beef could reduce the ability of retailers to purchase on traditional traits such as sex and conformation and could allow producers to receive returns based on quality and retail yield produced. Many retailers fear that as they believe that the quality of the product would be lower for boxed beef. Consequently, retailers feel that strictly defined specifications on types of carcasses are essential before contracting for boxed beef from contractors.

Structural Change in the Industry

Central processing will have significant impacts on the structure of the beef marketing system. Processing will move out of individual retail stores and most likely to the point of slaughter. As a result, concentration of both buyers and sellers in the wholesale beef market could increase. Furthermore, most of the processing would be done by packers. The role of independent wholesalers is most likely to evolve to that of a purveyor.

¹⁹ C.E. Bowes, "Revolutionizing the Beef Distribution System", Proceedings, Annual Meeting of the Meat Packers Council of Canada (1975).

²⁰ Dr. H. Fredeen. Report to the Commission on Beef Carcass Grading (1975).

²¹ Ibid.

Most central processing is now done by retailers and in most cases close to the point of consumption. The above analysis of efficiencies indicated that many of the economies of boxed beef relate to the lower cost and less deterioration when beef is shipped long distances. This will stimulate more processing to be done at the point of slaughter. Such a change may have unfavourable consequences for cattle producers in deficit markets like Quebec, B.C. and the Maritimes. Producers in these provinces could have limited markets in which to sell beef if the major chains purchase only boxed beef and if no boxing facilities exist in those regions because the supply is inadequate to justify them. Suppliers to Safeway stores in B.C. and Ontario already face such a problem as all stores in these regions are served by Safeway's central processing plant in Calgary. Other major stores in B.C. might well follow this same pattern and if so, B.C. cattle producers could find prices they receive reduced to the Alberta price less freight while B.C. retailers would pay Alberta price plus freight. To a lesser degree Quebec and the Maritimes could face similar situations.

Concentration at packer and retail levels could increase in the market for boxed beef compared to the current wholesale carcass market. Small packers may not be able to raise the necessary capital to add control processing facilities to their existing plants.²² Consequently, it may be the major packers that initially dominate this market. Retailers doing their own central processing do not necessarily increase concentration in buying nor can this be considered increased vertical integration since it only represents a shift in the location of processing from store level to a central location. Frequently, however, there are other complimentary activities which can increase retailer concentration. Central processing may accelerate the concentration of large chains either with the innovators gaining through the usual competitive process or forcing independent stores into a voluntary chain with a strong central buying agency.

Retailers, even in the deficit markets of B.C., Quebec and the Maritimes, are likely to be purchasing either boxed beef or carcasses (for their central processing plants) directly from packers, thereby eliminating much of the role now played by independent wholesalers. These firms are likely to shift to supplying the HRI trade rather than retail grocers.

The debate as to the logic or desirability of whether retailers or packers should control the central processing facilities is not completely resolved. While most of the economic pressures point to the packer emerging as the central processor, these economic advantages may not be very large at all. The packer has many more and varied types of markets in which to sell than the retailers, and thus, the packer should be able to obtain the

²² Adding boxing facilities to a slaughtering plant is likely to require an approximately 40 percent additional investment to the plant alone. Thus a plant processing 2,500 head per week would cost approximately \$8 million and with boxing facilities \$11.2 million (estimates provided by an industry source).

highest revenue from the sale of the carcass by exploiting the different market demands for each cut. It has not been clearly demonstrated that much additional income will be derived. In fact, under the existing cuts market, frequently the carcass sells at a premium. Consequently, the packer has traditionally sold carcass beef whenever possible since generally it was more profitable than the sale of primal cuts from the carcass. Retailers have generally found that certain cuts create problems in merchandising and logically should wish to obtain only the easily sold parts of the carcass. Nevertheless, traditional retailer purchasing has been largely beef in carcass form. It is anticipated, however, that under a market where cuts are more freely traded and a large number of uniformly high quality carcasses are broken, this situation will change. Sanitation problems increase the longer carcasses are held before boxing or if they are moved to a new location. Again, this favours boxing being done at the packinghouse level.

Retailers owning their own facilities are exclusive suppliers to their stores and because of the importance of beef cannot afford work stoppages through labour strikes. As a result, wages at retailer-owned central processing facilities soon rise well above those in comparable packinghouse plants.²³ Initially retailers entered into central processing themselves partly because they are more innovative than packers and they felt that they could not get the consistent type of product required at the price they believed was reasonable. The type of contractual arrangement required to ensure this exceeded the wishes of both parties. As more packers have become committed to central processing, competition will force them to process their highest (not lowest) quality animals at competitive prices. When sufficient numbers of packers reach this stage, many retailers will likely relinquish the processing role to packers.

Some retailers, in briefs presented to the Commission, expressed a desire for packers to undertake the central processing function.²⁴ Others have also indicated similar views during interviews.

Market Operation

The general adoption of central processing in the beef industry will lead to increased trade in primal and sub-primal cuts. This evolution will not occur quickly or completely. Retailers owning their own central processing facilities will still wish to purchase carcasses. Moreover, packers may wish to sell boxed carcasses, since this requires less merchandising than the balancing required when selling cuts. If there are increased returns to the total carcass resulting from exploitation of highest priced markets, this will only occur when a strong cuts market develops.

²³ An example of this is shown in the U.S. where Safeway central processing meat cutters earn about \$3.50/hour more than comparable packinghouse workers.

²⁴ A&P, Oshawa Group and Loblaws were three retailers expressing this view.

Trade in trimmed sub-primal cuts will result in a much larger variety of products traded than was the case with carcasses. Distinctive "house brands" are likely to develop initially since each packer and each buyer would like to have unique specifications or forms of cuts to merchandise.²⁵ The U.S. has a widely used Meat Buyers Guide to Standardised Meat Cuts,²⁵ which illustrates precise specifications of 71 sub-primal cuts so that ordering by number and grade and weight is possible. The Canadian Government Standards developed by the Department of National Defense is a similar manual but is not satisfactory for Canadian retailers in the HRI trade. A Canadian manual probably should be written either²⁶ by an industry association or industry in co-operation with government. To be acceptable, such a document must have primary involvement by all segments of the beef marketing system. Such a set of standards would greatly facilitate trade in cuts. Otherwise dominant industry firms will establish trade standards which the smaller firms will be forced to accept. In the U.S., two of the innovative firms in central processing of beef (Monforts and Iowa Beef Processors) have essentially established the standards for the beef industry which others have been forced to follow.

The present Montreal weekly pricing process for carcasses may be eroded when more beef begins to move into Montreal in cuts form. A direct packer to retailer negotiation is likely to evolve on a daily (or hourly) basis for each individual firm and the bargaining would be for a variety of different beef products. Under present market trends, this change is unlikely to happen quickly, in part since trade in primals generally is unlikely to evolve very fast and structural change in Montreal is unlikely to occur quickly.

Current prices for boxed beef are frequently negotiated as an upgrade from carcass prices. These charges range from 5 cents to 10 cents/lb. depending on the degree of processing involved. This is likely to remain the most common method of boxed beef pricing in the short term.

Constraints to Adoption

The impact of boxed beef may not be as great as indicated above for a number of reasons, such as, savings are not seen as large as projected, quality is anticipated to be lower, and uncertainty over future direction of central processing.

Savings from boxed beef cannot be realized in the short run because of a number of constraints in adjusting to the new technology. For example, labour contracts with some retail firms specify that a minimum number of carcasses must be processed at store level (e.g. Loblaws).

²⁵ National Association of Meat Purveyors, Meat Buyers Guide to Standardised Meat Cuts, Taeson, Arizona. A similar guide for portion control exists for 26 steaks and 17 roasts.

²⁶ The Food Service Industry Committee of Meat Packers Council is working on appropriate standards.

for small stores, labour savings may not be possible, as the owner may also be the butcher.²⁷ For existing stores that already have the investment in equipment the impact of the savings from central processing may never be fully realized.²⁸ Moreover, most retailers are not aware of the total costs of breaking beef in retail stores since their cost accounting system does not isolate beef results. Thus, the savings from boxed beef appear to be negative ones.

The mistrust of packers by retailers and vice versa as well as several marketing and technical problems have led to a slow adoption rate for boxed beef. Traditionally, retailers have not wanted to be committed solely to a single supplier. For example, A&P did not go on a boxed beef program until three suppliers were available. Problems of film quality, leaking bags, colour deterioration and a fear of stale or inferior quality carcasses being boxed by packers also affected retail adoption. Since beef is a major drawing card for retailers, firms are reluctant to relinquish any control over quality of the product. The dominant Ontario firm has built a reputation on its beef quality and is fearful of changes. Because meat packing has traditionally be a low profit business, it is difficult to raise the capital necessary to construct the boxing operation. The expectation that central processing to primal cuts is simply an interim stage before a more sophisticated form of central processing becomes available may have caused some retailers to be hesitant about investing in technology which may shortly be obsolete.

²⁷ A fundamental question as to the extent that boxed beef will be adopted is the minimum size of store for utilization of boxed beef to be profitable.

²⁸ This process may not be as slow as ome believe. For example, A&P have been on a boxed beef program for two and a half years and during this period have opened 30 new stores.

2. WHAT IS THE NEXT STEP?

The process of breaking a carcass into retail-ready packages can be accomplished in numerous ways. The two-step process currently used in boxed beef, where carcasses are first broken into sub-primals at a central location and packaged, and later broken into retail cuts and packaged at retail stores is considered by some to be only an intermediate stage. They believe that the ultimate in central processing is to break carcasses directly into retail cuts and package at a central location. Many retailers replied to a Commission questionnaire claiming that counter-ready, centrally processed beef would likely be handled by them in three to five years and many others anticipated this within 10 years. Only two regional divisions of firms predicted that they would not be receiving beef in boxed form by 1978. Some firms predicted less than complete receipts in this form and others declined to forecast. One firm currently not receiving centrally processed beef anticipates a change to retail-ready cuts in three to five years, while another large firm not using boxed beef did not provide any response. Other retailer responses did not follow any pattern. For example, some of the industry innovators in boxed beef could not foresee any change, while others did.

It is difficult to differentiate the retailer responses to the questionnaire between those which are simply "wishful thinking" and those which are the result of feasibility studies or actual part of corporate planning. Only a handful of experiments of central processing to the retail level in either fresh or frozen form have been tried in North America and few of these remain. While it is considered by many to simply be a matter of time before it occurs, its introduction at the moment appears, even to researchers, as elusive as it was a decade ago. Thus, it is predicted that it probably will be a phenomenon not realized before the 1990's, if at all, when retailers receive counter-ready beef products as they do not for such things as pre-packaged bacon or frozen turkeys. The reason for this less than optimistic viewpoint is a combination of inter-related technical, distributive, merchandising, and retailer and consumer acceptance problems. The remainder of this section provides a discussion of some of these problems and highlights a few of the emerging innovations in the area of central processing.

There are five possible alternatives as to the next major change in central processing. Some of these are not strictly alternatives since a combination may occur. They are:

- (i) modification in the methods of sub-primal preparation and packaging of ground beef;
- (ii) central butchering of primals into retail-ready cuts, bulk packaged in oxygen impermeable film with individual wrapping at retail level;
- (iii) central packaging in oxygen permeable film, over-wrapped with oxygen impermeable film and contents flushed with a carbon dioxide/oxygen mixture;
- (iv) fresh retail-ready cuts;
- (v) frozen retail cuts.

Each of these alternatives is discussed in more detail below, outlining the advantages and problems of each.

(i) Further sub-primal cuts. The first alternative is simply a consolidation of the basic practices of central processing, involving experimentation to provide the most suitable product for retailers to use. Many of the efficiencies from the central processing technique have not yet been fully realized. For example, the central processing of ground beef provides considerable efficiencies. It is being merchandised in five and 10-pound chubs, protected by oxygen impermeable film. In the U.S., a retail store (Winn Dixie) is merchandising sub-primals wrapped in an oxygen impermeable film directly to consumers. The problems of colour and odour of such a method are discussed in the fourth alternative of consumer packaging of fresh beef in this material. This alternative likely will be adopted and could be the major direction for the next decade.

(ii) Bulk retail-ready cuts. The second alternative utilizes streamlined primals, which are centrally cut into a retail-ready form and then reassembled back into primal cuts. They are packed in a vacuum oxygen impermeable film for delivery to retail stores. At the retail store, they are re-wrapped as needed. This alternative presents consumers with the same product in the same form as they now expect it, i.e., wrapped fresh on trays with the acceptable cherry red colour. This procedure permits all of the cutting and trimming to be done centrally thereby achieving similar economies of scale as found for breaking the carcass into primals. This alternative can potentially attain a shelf life of three weeks in a holding area, plus a three-day case life after it has been re-wrapped for boneless products or a two-week, two-day shelf life for bone-in product. In this procedure, carcasses cannot be cut before the internal temperatures is lowered to $1^{\circ}\text{--}2^{\circ}\text{C}$ or the shelf life diminishes rather quickly and considerable weeping occurs. This alternative appears to be a logical extension of the present processing to the sub-primal level, and the probability of its adoption appears rather high.

A fundamental problem of central pre-packaging to retail cuts is that while the shelf life of carcasses is 15-20 days, for retail cuts it is only two to four days before there are undesirable changes in colour (from red to brown) and odour. The large exposed surfaces of cuts like steaks, particularly those with bones, provide excellent cultures for bacterial growth. As a result, beef cannot be transported very far or held very long after it is cut in retail-ready form (using current oxygen permeable film), an important aspect for location of central processing.

(iii) Retail cuts with over-wrap. The third alternative is a means of extending the shelf life for beef by providing a gas atmosphere which retards bacterial growth and change in colour and odour.²⁹ Carbon dioxide (CO_2) improves "odour, shelf life" since it retards the growth of

²⁹ Much of the information presented below was obtained from research work of Dr. D.S. Clark, Division of Biology, National Research Council.

psychrotolerant or slime-producing bacteria. At 5°C, an atmosphere of 15-20 percent CO₂ increases "odour shelf life" from six days (without CO₂) to eight days. High oxygen (O₂) concentrations (50-85 percent) retards colour change since myoglobin (the meat pigment) is held in oxygenated form longer, and it also inhibits the growth of bacteria. At 5°C, an 85 percent O₂ atmosphere increased "colour shelf life" by three days (from five to eight days) and "odour shelf life" by two days (from six to eight days). An 85 percent O₂ and 15 percent CO₂ atmosphere increases "odour shelf life" by 13 days and "colour shelf life" by nine days. The retail cuts of beef would be packaged in two layers of film with the inner bag being oxygen permeable and the outer impermeable. This alternative is still in the laboratory stage and successful commercial applications have not yet been achieved.³⁰

(iv) Retail-ready cuts. The fourth alternative of central processing to retail cuts can be accomplished by two methods. There are a few firms that have been centrally preparing retail cuts and packaging them in oxygen permeable film for direct-to-store delivery. Liberal Markets, a retailer based in Dayton, Ohio, supplies the beef for 42 stores, all of which lie within a 50-minute radius of their central warehouse. This appears to be close to the maximum distance which can be served using this type of central processing. It involves frequent plant to store deliveries (two per day) and maintaining product quality in transit (i.e. avoiding crushing) has been a major problem. Some European firms apparently have also been using this type of central processing.³¹ However, another retailer firm in the U.S., Ralph's in Los Angeles, California, has tried this type of central processing and has scrapped the system because quality was difficult to maintain and this firm had a reputation for a high quality product. With the recent large increases in fuel costs, it may not be economical to use this process with the same delivery schedule. This alternative could most successfully be used by a large retailer in a densely populated market area.

The other approach used in this alternative is central processing of certain types of retail cuts and packaging them in oxygen impermeable film. For example, in the U.S., Winn Dixie is merchandising a boneless, aged, branded steak to a select clientele. The major problem is that in the material the steaks become quite dark in colour and have an offensive odour when opened. The red colour or "bloom" returns in about 30 minutes while the odour quickly disappears. The salesmanship of the butcher and

³⁰ An experiment was undertaken by Swifts in the 1960's resulting in considerable technical and marketing difficulties. Other firms have plans for the commercial application of this approach.

³¹ Birmingham Co-op Society in England started centralized retail cutting in 1960, serving 30 retail outlets, all within a 30-mile radius. Daily deliveries are made to each store. Savings of 43 percent in labour occurred in the first year of operation with 20 percent increase in productivity.

repeat business have promoted the product. There is a consumer education process required to assure them that the product is fresh and wholesome. The shelf life of this product is greatly extended but low temperatures are important to retard the darkening of the meat. Special lighting in the retail store can give the meat an appearance of being cherry red. Costs are about 2 cents a package higher than with regular wraps (5 cents vs. 3 cents). In some European countries (e.g. Switzerland), these consumer vacuum packages are being merchandised extensively in retail outlets. However, they do not have a colour problem since their beef is much darker than in North America. This alternative might be adopted for selected cuts, but is unlikely to be widely used in the foreseeable future.

(v) Frozen beef. The last alternative, frozen beef centrally prepared into retail cuts, is considered by some to be the ultimate in the beef processing and distribution. It has been predicted that widespread acceptance of frozen beef by retailers and consumers is just around the corner since it offers an extended storage life of up to 12 months and quality is not impaired by freezing. Others consider frozen beef to be a retrogressive step from fresh beef distribution, since it gives a poorer quality product. The percentage of sales of turkeys and certain HRI beef cuts in a fresh state have recently increased indicating consumer preference for the fresh form.

Frozen beef faces a number of technological problems. First, if the product is frozen immediately after slaughter, there is no opportunity for aging, a requirement to tenderize the beef. In fact, some firms, such as Dominion, like to age beef up to 14 days. In cases like this, many of the advantages of frozen beef would be lost. The aging problem, perhaps, could be overcome by mechanical or chemical means of tenderizing. Secondly, frozen beef when exposed to light rapidly loses colour and more slowly loses flavour.³² The loss of colour may occur after one day at -7°C , after seven days at -20°C or after two months at -40°C . Protected from light, these times are extended to seven days at -7°C and more than four months at -20°C or below. Changes in flavour also occur if beef is exposed to light after two weeks at -7°C and after four months at -20°C . Consumers accustomed to a cherry red colour believe that the frozen product is either stale or otherwise inferior to the fresh product. The colour problem could be partly overcome with the development of an appropriate protective packaging which is impervious to light.³³ Thirdly, temperature fluctuations for beef cause frost build-up in packages. A new process, Bivac, has been introduced in Canada and the U.S. This process provides a skin tight vacuum seal for retail cuts of frozen beef and thus, eliminates the frost build-up problem.

³² Much of the information presented below was obtained from Mr. C.P. Lentz, Division of Biology, National Research Council.

³³ Because of inadequate transportation and display facilities and particularly the means to distribute to consumers' homes, this is quite common.

Frozen beef requires more energy for initial freezing and for storage than does fresh killed beef. Existing transportation and retail display equipment are not adequate to maintain temperatures sufficiently low (-25°C) to ensure good product colour and product quality. Also, a switch to frozen beef would involve considerable capital expenditures for new equipment. Despite these problems, a small amount of beef is now being merchandised frozen. For example, beef patties are sold frozen but some of these are in a box which screens out light. Since frozen beef would raise consumer costs and since current fed cattle production is not highly seasonal, frozen beef does not appear to provide any additional benefit. Moreover, rising energy costs may further add to its disadvantages.

A number of experiments in selling frozen beef at the retail level have been tried, for example, by Swifts in the mid-1950's, Jewel Tea and lately by firms using the vacuum seal approach with equipment supplied by Bivac. The latter has been tried with limited success for selected cuts at convenience stores.

The main problem with frozen beef in the past has been the lack of consumer acceptance. Thus, a substantial consumer education process will be required, or simply a lack of choice, before frozen beef becomes acceptable. A number of research studies have been undertaken to assess why consumers do not purchase frozen beef. The main reasons relate to appearance, quality, cost, convenience, packaging, concern about freshness and promotion.³⁴ Many retailers treated frozen beef test programs like bacon or pre-packaged meats and took a higher mark-up than with fresh beef despite the fact that preparation costs were much lower.³⁵ The consumer, faced with higher prices and a less desirable product, made the obvious choice. The most viable directions to which the industry is headed in the area of central processing for the 1970's and perhaps even later would appear to be alternatives one and two. There is the possibility that a major retailer could adopt central processing to pre-packaged fresh, retail cuts in a limited densely populated market area. This operation would undoubtedly be retailer-owned and would bring in beef in carcass form. This would probably only be feasible for one or two major retailers with a large number of stores within a major urban market.

³⁴ See Study by F.M. Jensen, A Comparison of Demand and Factors Affecting Consumer Acceptance of Fresh and Frozen Meat, unpublished PhD thesis Kansas State University (1973)

³⁵ Prices for similar quality cuts were as much as 100 percent higher for frozen beef in corporate chain stores. United States Department of Agriculture, Distribution Practices for Pre-packaged Meat, p. 19.

SUMMARY AND IMPLICATIONS

Central processing of beef involves breaking carcasses to trimmed sub-primal cuts at a central location, using an assembly line process and packaging cuts in a protected environment such as an oxygen impermeable film or a box with CO₂. This reduces the extent of processing at the individual retail store level protects the meat in transit, extends storage life, and improves distribution of cuts to highest demand areas.

Currently, one third of the beef received at major retail stores is in boxed form. There is, however, substantial variation among regions, with majority of receipts in this form in B.C. and Alberta, slightly less in Quebec, a small amount in Ontario and virtually none in Saskatchewan, Manitoba and the Maritimes. Most of the boxing is done by corporate chain food retailers in the region of consumption. All packers and most retailers expect major increases in boxed beef production over the next few years.

This study has concluded that there is little increase in efficiency from centrally processing beef at a central rather than an in-store location, since the savings from the assembly line cutting process, transportation and shrink, and higher value from bones and fat are partially offset by higher packaging costs and committed investments by retailers to receiving carcasses. Nevertheless, retailers are likely to increase their net returns from using boxed beef because spoilage losses and markdowns may be considerably less, more time can be spent merchandising rather than processing, only fastest moving cuts need to be purchased, store sales volume could increase with existing labour and equipment, and inventory control may be more accurate and less costly.

The question of whether the control of processing facilities should be by packers or retailers is not one which is judged on the basis of distribution efficiency, except where the retailer processes at the point of consumption in a deficit region. There are, however, important advantages for central processing to be done at the packing level. In these cases, there is a better opportunity to segment markets, less chance for retailers to unfairly discriminate against certain types of carcasses (e.g. heifers, A1-X) and an improved sanitation through reduced naked carcass movement.

Central processing could increase concentration of ownership in the wholesale beef market. The substantial investments and additional labour required for boxing facilities may limit expansion to the major packers. At the retail level, innovators may expand at the expense of others and independents may find it necessary to be associated with a voluntary chain with centralized purchasing.

The price setting mechanism for beef at the wholesale level in Canada is likely to change markedly as more sales occur for primal cuts instead of carcasses and the Montreal wholesalers are no longer the dominant supplier of large retailers. These changes, however, are unlikely to occur very quickly.

The next stage in the evolution of central processing of beef is likely to be a further extension of the current method of central processing involving slightly more cutting and trimming at the sub-primal level. It seems both unlikely and undesirable for the industry to move to centrally processed frozen retail-ready cuts. It is possible to prepare retail cuts and reassemble them into boxed primal cuts, or a large firm in a metropolitan area may process directly to retail cuts for local store delivery. These may be the possible longer directions towards which the industry will evolve.

While the adoption of central processing has been proceeding rapidly and will continue to do so, carcasses will likely remain the dominant form in which packers ship beef for a considerable period. Consequently, the price setting mechanism will continue to be based mainly on carcasses. The rate and form in which a few dominant retailers adopt centrally processed beef will have an extremely large bearing on the future direction of the marketing system. It is anticipated that major growth in the production of boxed beef will occur at the packinghouse level, but such changes are far from certain.

The federal government must adjust its facilitating services now provided to industry to ensure that they are consistent with its new emerging structure. A most important area is market information, which will become more complex as the variety and type of products traded becomes greater. Health inspection services may also need to be modified. Government may wish to accelerate the adoption of central processing through research and development assistance. Factors retarding its change such as labour legislation, tax regulations or incentive grants may need to be adjusted accordingly.

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Table 1 : Volume of Beef Boxed, by Location, by Type of Firm, 1974

Type of Firm		B.C.	Alta.	Sask	Man.	Ont.	Que.	Atl.	Total
Packer-Total	(000 cwt.)	21	98	15	22	55	0	0	210
	(%)	16.4	25.1	100.0	100.0	35.0	0.0	0.0	16.8
Chain	(000 cwt.)								156
	(%)								12.5
Independent	(000 cwt.)								54
	(%)								4.3
Wholesaler-									
Total	(000 cwt.)	107	292	0	0	102	542	0	1,042
	(%)	83.6	74.9	0.0	0.0	65.0	100.0	0.0	83.2
Chain	(000 cwt.)								1
	(%)								0.1
Independent	(000 cwt.)								4
	(%)								0.3
Retailer	(000 cwt.)								1,037
	(%)								82.8
Total	(000 Cwt.)	128	390	15	22	157	542	0	1,252
	(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Commission survey

Table 2

Shipments of Beef from Slaughtering Plants, by Type of Beef by Region, 1974

Type \ Province		B.C.	Alta.	Sask.	Man.	Ont.	Que.	Atl. Prov.	Total Canada
Sides and Quarters	(000 cwt.)	104	3,848	843	1,525	2,454	588	89	9,451
	(%)	48.1	70.2	84.0	62.6	53.2	86.1	52.0	64.7
Primals	(000 cwt.)	31	472	52	316	1,388	53	19	2,331
	(%)	14.4	8.6	5.2	13.0	30.1	7.8	11.1	16.0
Boxed-Beef	(000 cwt.)	21	98	15	22	54	0	0	210
	(%)	9.7	1.8	1.5	0.9	1.2	0.0	0.0	1.4
Boneless Beef	(000 cwt.)	14	103	29	128	218	40	30	562
	(%)	6.5	1.9	2.9	5.3	4.7	5.9	17.5	3.8
Other	(000 cwt.)	46	104	42	31	249	1	33	506
	(%)	21.3	1.9	4.2	1.3	5.4	0.1	19.3	3.5
Total ¹	(000 cwt.)	216	5,480	1,004	2,435	4,615	683	171	14,604
	(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 3

Shipments of Beef from Slaughtering Plants, by Type of Beef, by Region, 1975 (I)

Type \ Province		B.C.	Alta.	Sask.	Man.	Ont.	Que.	Atl. Prov.	Total Canada
Side and Quarters	(000 cwt)	28	1,122	191	324	580	121	25	2,391
	(%)	49.1	67.4	80.9	54.4	48.2	84.0	48.1	60.5
Primals	(000 cwt.)	8	190	12	98	423	11	7	749
	(%)	14.0	11.4	5.1	16.4	35.2	7.6	13.5	18.9
Boxed	(000 cwt.)	10	46	4	35	15	0	0	109
	(%)	17.5	2.8	1.7	5.9	1.2	0.0	0.0	2.8
Boneless	(000 cwt.)	3	33	10	31	64	11	8	161
	(%)	5.3	2.0	4.2	5.2	5.3	7.6	15.4	4.1
Other	(000 cwt.)	8	42	15	6	61	0	11	143
	(%)	14.0	2.5	6.4	1.0	5.1	0.0	21.1	3.6
Total	(000 cwt.)	57	1,165	236	596	1,203	144	52	3,953
	(%)	100	100	100	100	100	100	100	100

Source: Commission Survey.

¹ Subcategories may not sum to totals due to missing data.

Table 4

Receipts of Beef by Retail Establishments, by Type of Beef, by Location, 1974

Type \ Province		B.C.	Alta.	Sask.	Man.	Ont.	Que.	Atl. Prov.	Total Canada
Sides and Quarters	(000 cwt.)	80	187	39	176	814	630	72	1,999
	(%)	22.2	39.3	58.2	75.2	54.6	36.2	82.8	44.8
Primals	(000 cwt.)	16	55	12	47	237	321	13	700
	(%)	4.4	11.6	17.9	20.1	15.9	18.4	14.9	15.7
Boxed-Beef	(000 cwt.)	253	182	0	0	125	686	0	1,246
	(%)	70.1	38.2	0.0	0.0	8.4	39.4	0.0	28.0
Boneless Beef	(000 cwt.)	11	53	1	11	106	105	2	287
	(%)	3.0	11.1	1.5	4.7	7.1	6.0	2.3	6.4
Total ¹	(000 cwt.)	361	476	67	234	1,491	1,742	87	4,458
	(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5

Receipts of Beef by Retail Establishments by Type of Beef, by Location, 1975 (I)

Type \ Province		B.C.	Alta	Sask	Man	Ont.	Que.	Atl. Prov.	Total Canada
Sides and Quarters	(000 cwt.)	23	9	11	42	205	156	23	469
	(%)	22.1	9.3	73.3	65.6	46.5	35.5	88.5	39.5
Primals	(000 cwt.)	2	14	4	17	91	89	2	219
	(%)	1.9	14.4	26.7	26.6	20.6	20.2	7.7	18.4
Boxed Beef	(000 cwt.)	78	58	0	1	50	173	0	358
	(%)	75.0	59.8	0.0	1.6	11.3	39.3	0.0	30.2
Boneless Beef	(000 cwt.)	1	16	0	4	34	22	1	78
	(%)	1.0	16.5	0.0	6.2	7.7	5.0	3.8	6.6
Total ¹	(000 cwt.)	104	97	15	64	441	440	26	1,187
	(%)	100	100	100	100	100	100	100	100

¹ Subcategories do not necessarily sum to the total due to missing specifications in the model

Source: Commission Survey

Units: 000 cwt.
percent

Table 66: Number of Retail Grocers Receiving Boxed Beef,
by Percentage of Receipts, by Type of Ownership,
1974 (Canada)

	Major	Indep- endent	Voluntary Chain	Total
Zero	22 ^a 68.8 ^b 62.9 ^c	1 3.1 100.0	9 28.1 81.8	32 ^b 68.1 ^b
0-10 percent	1 100.0 2.9	0 0.0 0.0	0 0.0 0.0	1 2.1
10-33.3 percent	0 0.0 0.0	0 0.0 0.0	1 100.0 9.1	1 2.1
33.3-50 percent	0 0.0 0.0	0 0.0 0.0	1 100.0 9.1	1 2.1
50-66.7 percent	2 100.0 5.7	0 0.0 0.0	0 0.0 0.0	2 4.3
66.7-95 percent	9 100.0 25.7	0 0.0 0.0	0 0.0 0.0	9 19.1
Greater than 95 percent	1 100.0 2.9	0 0.0 0.0	0 0.0 0.0	1 2.1
Total	35 74.5 ^c	1 2.1	11 23.4	47 100.0

^a Number of firms

^b Percent by percent of receipts

^c Percent by ownership type

Source: Commission survey

Table 7: Number of Retail Grocers Receiving Boxed-Beef, by Percentage of Receipts, by Size of Firm, 1974 (Canada)

	SIZE ('000 cwt. of Receipts)	0-50	50-100	100-250	250-500	500-750	Total
Zero	16 ^a 50.0 ^b 66.7 ^c	7 21.9 87.5	7 21.9 63.6	1 3.1 50.0	1 3.1 50.0	32 ^b 68.1 ^b	
0-10 percent	0 0.0 0.0	0 0.0 0.0	1 100.0 0.0	0 0.0 50.0	0 0.0 0.0	1 2.1	
10-33.3 percent	0 0.0 0.0	0 0.0 0.0	0 0.0 0.0	1 100.0 50.0	0 0.0 0.0	1 2.1	
33.3-50 percent	1 100.0 4.2	0 0.0 0.0	0 0.0 0.0	0 0.0 0.0	0 0.0 0.0	1 2.1	
50-66.7 percent	0 0.0 0.0	0 0.0 0.0	2 100.0 18.2	0 0.0 0.0	0 0.0 0.0	2 4.3	
66.7-95 percent	7 77.8 29.2	0 0.0 0.0	1 11.1 9.1	0 0.0 0.0	1 11.1 50.0	9 19.1	
Greater than 95 percent	0 0.0 0.0	1 100.0 12.5	0 0.0 0.0	0 0.0 0.0	0 0.0 0.0	1 2.1	
Total	24 ^c 51.1 ^c	8 17.0	11 23.4	2 4.3	2 4.3	47 100.0	

^a Number of firms

^b Percent by percent of receipts

^c Percent by size

Source: Commission survey.

Table 8: Cryovac's Survey of Retailers on the Type and Packaging
of Beef Received, 1972, 1974 and projections for 1980

A. Fabrication Prior to Receipt at Retail Level

	Canada		U.S.		
	1972	1974	1972	1974	1980
	percent				
Carcasses, Sides quarters	44	34	47.5	30.9	11.2
Primal and subprimal	56	63	51	68.1	78.8
Consumer cuts	--	3	1.5	1.0	10.0
Total	100	100	100	100	100

B. Primal and Sub Primal Beef Packaging Prior to Receipt at Retail Store

	Canada		U.S.		
	1974	1980	1972	1974	1980
	percent				
Vacuum Plastic film					
bags	63	85	31	55	77
Non vacuum plastic film	4	1	28	33	22
none or paper shroud	33	14	40	12	2
Total	100	100	100	100	100

Sources: Canada Canadian Grocery August 1975

U.S. Packaging Digest July 1975

Table 9: Costs of Alternative Methods of Receiving Beef

Alternative	<u>Annual Volume in Million Pounds</u>		
	40	46	52
	(dollars/lb.)		
Packer Distribution Centre Shipping			
Carcass Beef direct to Store	.0513	.0513	.0513
Chain Distribution Centre shipping			
Carcass Beef	.0503	.0498	.0494
	.0361	.0362	.0361
	.0142	.0136	.0133
Chain Distribution Centre			
shipping Primal Cuts	.0482	.0477	.0474
	.0315	.0314	.0315
	.0167	.0163	.0159
Chain Distribution Centre			
Receiving and Shipping Primal Cuts	.0453	.0446	.0444
	.0339	.0340	.0340
	.0114	.0106	.0104

Note: Costs for each alternative are listed in order: total costs, retail instore costs and distribution centre costs.

Source: Weatherly, Earle and Brown, Alternative Methods of Meat Distribution
Cornell University (1967)

Table 10: A Comparison of Costs of Alternative Forms of Central Processing

Organization Arrangement and Rank	Output Cost at Packer	Output Cost at Central Processor	Output Cost at Retail
Packer-Carcass Central Processor- Primals-Retail	\$0.47	\$0.60	\$0.73
Packer-Primals- Central Distributor- Primals-Retail	0.59	0.60	0.73
Packer-Carcass- Retail	0.47	0.00	0.74
Packer-Primals- Retail	0.61	0.00	0.74
Packer-Special- Retail	0.70	0.00	0.75
Packer-Carcass- Central Distribution- Carcass-Retail	0.48	0.49	0.75
Packer-Carcass- Central Processor- Special-Retail	0.47	0.70	0.75
Packer-Carcass- Central Processor- Frozen-Retail	0.47	0.70	0.75
Packer-Frozen- Retail	0.80	0.00	0.81
Packer-Primals- Central Processor- Special-Retail	0.59	0.84	0.90
Packer-Primals- Central Processor- Frozen-Retail	0.59	0.90	0.91

Source: R. Lichty. An Analysis of Alternative Fresh and Frozen Meat Distribution System, Kansas State University, 1971.

APPENDIX

METHODS USED IN THE CENTRAL CUTTING OF CARCASSES¹

The latest development of beef merchandising is the trend toward breaking all beef in the packing plant in which it was slaughtered. Not just into standard ribs, loins, hips and chucks but into sub-primal cuts. Some of the most common cuts being made are:

The Rib

1. Short ribs are removed
2. The chine bone is trimmed on the saw to where the individual steaks and roasts need no further trimming at retail.

The Loin

1. The flank is cut short, usually to where the T-bone and porterhouse steaks need not be trimmed individually.
2. The chine bone is also trimmed to where the steaks do not need individual trimming.
3. The sirloin may be separated from the short loin.

The Hip

1. Excess cod fat is trimmed off, especially from heifers.
2. The rump or pelvic bone is pulled.
3. The shank bone is removed at the strifle joint.
4. The shank may or may not be removed.
5. The sirloin tip may or may not be removed.

The Chuck

1. The atlas joint and throat meat are removed from the neck.
2. The chuck is usually split in two behind the knuckle.

Each sub-primal cut is trimmed according to specifications. For example, excess fat is usually removed. Admittedly not all packers take off as much of the outer fat or "bark" as some retailers would like. Nevertheless, far more waste is removed from these cuts than was ever removed from standard ribs, loins, hips and chucks.

¹ From: Revolutionizing the Beef Distribution System, C.G. Bowes, C.G. Bowes, Inc., Chicago, Illinois, Merchandising Consultant. Presented at the 55th Annual Meeting of the Meat Packers Council of Canada, February 10 and 11, 1975.

APPENDIX TABLE

Example of Primal and Sub-Primal Cuts from Central Processing Plant

<u>Primal and Sub-Primal</u>	<u>Percent of Carcass</u>
Hips	15
Sirloin Tips	4
Sirloin Butts	5
Short Loins	7
Ribs	5
Chucks	15
Cross Ribs	4
Centre Shanks	2
Short Ribs	3
	—
Total	60

<u>Other</u>	<u>Percent of Carcass</u>
Trimnings	10
Point Brisket	1
Plate Brisket	7
Flank	1
Bones	10
Fat	6
Boneless Stew Meat	4
	—
Total	39
Shrink	1

